SECTION 11: INFLUENZA AND PNEUMOCOCCAL IMMUNIZATIONS

Concern	Care/Test	Frequency
Immunizations	♦ Provide influenza vaccine	Annually, if age ≥ 6 months
	♦ Provide pneumococcal vaccine	Once; then per Advisory Committee on Immunization Practices

Each year about 60,000 people die in the United States from vaccine-preventable diseases. The majority of these are adults who die of complications from influenza and pneumococcal disease. Together, influenza and pneumococcal disease are the sixth leading cause of death for older adults. Although complications can occur at any age, the elderly and people with chronic health conditions are more likely to develop serious, life-threatening complications than younger, healthier people.

Influenza Vaccine

In the year 2000, only 66% of adults were immunized for influenza despite evidence that illness and death caused by influenza can be prevented with an annual influenza vaccination. Influenza and its complications kill approximately 40,000 people each year in the United States. Another 100,000 individuals are hospitalized due to the severity of illness. The Centers for Disease Control and Prevention (CDC) reports indicate that people with diabetes are six times more likely to be hospitalized during an influenza outbreak, compared to those without diabetes.

The Advisory Committee on Immunization Practices (ACIP) recommends the inactivated influenza vaccine for any person aged ≥ 6 months, including those with high risk conditions. Conditions, such as serious heart problems, chronic lung disease, metabolic disorders (including diabetes), chronic kidney disease, cancers, blood disorders, and immunosuppression are some of the multiple medical conditions that put people at increased risk for complications. In 2003, the live, attenuated influenza vaccine (LAIV) vaccine was approved for use among healthy people aged 5-49 years. It is a live vaccine, so precautions regarding use in households with immunocompromised people must be followed.

One dose of influenza vaccine is given *annually*. Two doses of influenza vaccine (administered at least one month apart) are recommended for children 6 months through 8 years of age who are receiving the vaccine for the first time. Close contacts of children aged 0-23 months are also advised to be vaccinated.

ACIP also recommends that pregnant women be given the influenza vaccine during *any* trimester of pregnancy. If a woman failed to receive the influenza vaccine during the pregnancy, she should be given the influenza vaccine in the immediate postpartum period as a household contact of the infant.

Annual revaccination with the current vaccine, usually between mid-October through December, is necessary because immunity only lasts 6-8 months and vaccine components may fail to include protection against virus currently in circulation. However, people may be immunized in September when vaccine for the forthcoming influenza season becomes available.

ACIP recommendations should be consulted for more specific precautions, specific contraindications to vaccination, side effects, and adverse reactions.

Pneumococcal Polysaccharide Vaccine and Pneumococcal Conjugate Vaccine

Streptococcus pneumoniae (pneumococcus) infection is among the leading causes worldwide of illness and death for children, people with underlying debilitiating medical condtions, and the elderly. Annually, the bacterium causes serious infections, resulting in more than 175,000 cases of hospitalized pneumonia, more than 50,000 cases of bacteremia, and an estimated 3,000 to 6,000 cases of bacterial meningitis. Approximately 10% of all people with invasive pneumococcal disease die of their illness, but case-fatality rates are higher for the elderly and people with certain medical conditions and/or illnesses, accounting for more deaths than any other vaccine-preventable bacterial disease. About half of these deaths could be prevented with the use of the 23-valent pneumococcal polysaccharide vaccine (PPV23). The risk of serious complications, as well as the recent evidence of antibiotic-resistant *pneumococci*, compound the management of invasive pneumococcal disease and emphasize the importance of the ACIP and the Academy of Pediatrics Report of the Committee on Infectious Diseases vaccination recommendations.

All people ≥ 65 years should receive <u>*one*</u> dose of the PPV23. This includes previously unvaccinated people and people who have not received the vaccine within five years and were < 65 years of age at the time of vaccination.

All people aged ≥ 2 years who have a normal immune system but have a chronic illness, including cardiovascular disease, pulmonary disease, diabetes mellitus, alcoholism, chronic liver disease (cirrhosis), or cerebrospinal fluid leaks, should receive one dose of the PPV23. Diabetes is often associated with cardiovascular or renal dysfunction, which increase the risk for severe pneumococcal illness. Previous studies have shown an increased risk of pneumococcal bacteremia during episodes of diabetic ketoacidosis, although age-specific information is limited. Immunocompromised people aged ≥ 2 years who are at risk of pneumococcal disease or its complications should also be vaccinated.

For all children 2-23 months of age, ACIP recommends the 7-valent pneumococcal conjugate vaccine (PCV7). The ACIP also recommended PCV7 vaccine for children 24-59 months of age who are at high risk of pneumococcal infection caused by an underlying medical condition, such as children with diabetes mellitus. Revaccination after the age-appropriate primary series with PCV7 is not currently recommended. Children of certain racial and ethnic groups have been found to be at increased risk of pneumococcal disease; therefore, they must be carefully assessed for appropriate immunization.

In October 2002, the CDC recommended that all people with cochlear implants receive age-appropriate pneumococcal vaccination with the PCV7, the PPV23, or both according to the ACIP schedules for people at high risk.

The ACIP recommendations should be consulted for specific dose schedules, precautions, contraindications to use, side effects, adverse reactions, and additional information. The safety of the PCV7 vaccine during the first trimester of pregnancy has not been evaluated.

Following vaccination with PPV23, antibody levels decline after 5-10 years and may decrease more rapidly in some groups than others. Because of the lack of evidence of improved protection with multiple doses of pneumococcal vaccines, routine vaccination schedules are summarized in Table 15.

Table 15: Advisory Committee on Immunization Practices Pneumococcal Revaccination Recommendations

Group	Revaccinate	Special Considerations
People ≥ 2 years of age at highest risk of pneumococcal infection, including those with: ✓ functional or anatomic asplenia✷ ✓ HIV infection ✓ leukemia, lymphoma, Hodgkin's disease, multiple myeloma, generalized malignancy ✓ chronic renal failure, nephrotic syndrome ✓ organ or bone marrow transplant ✓ immunosupressive chemotherapy (including long-term systemic corticosteroids)	Yes	• In people ≤ 10 years of age: consider single revaccination 3 years after previous dose • In people > 10 years of age: single revaccination ≥ 5 years after previous dose
Immunocompetent people ≥ 2 years of age previously vaccinated, including those with: ✓ chronic cardiovascular disease✠, chronic pulmonary disease❖, or diabetes mellitus ✓ alcoholism, chronic liver disease⌘, cerebrospinal fluid leaks ✓ special environmental or social settings (including Alaskan Natives and certain American Indian populations)	No, except ➔	Revaccinate only if: ✓ now ≥ 65 years of age; and ✓ < 65 years of age at time of initial vaccination; and ✓ ≥ 5 years have passed since initial vaccination

✷ Including sickle cell disease and splenectomy
✠ Including congestive heart failure and cardiomyopathies
❖ Including chronic obstructive pulmonary disease and emphysema
⌘ Including cirrhosis

Essential Patient Education for Influenza and Pneumococcal Disease

Educational strategies should take into consideration special educational or cultural needs and literacy level/skill, while respecting the individual's willingness to change behavior. Education may include, but is not limited to, the following:

- Immunization can prevent serious illness, complications, and the need for hospitalizations associated with influenza and pneumococcal disease.
- People should be informed of side effects and adverse reactions to immunizations. The pamphlet titled "*Protect Yourself against Influenza and Pneumococcal Pneumonia,*" POH 4366*,* is available from the Wisconsin Immunization Program*,* 1 W. Wilson Street, Rm 318, PO Box 2659, Madison, WI 53701-2659, phone (608) 266-2346.

Immunization Record Keeping

To help prevent the administration of unnecessary doses, every person should be given a record of their vaccinations. Recording vaccinations given in a shared electronic registry, such as the Wisconsin Immunization Registry (WIR), is recommended to allow health care providers around

the state access to individual vaccination records. Primary care providers should also ensure that childhood and other recommended preventive vaccinations are up to date.

References

1) Committee on Infectious Diseases, American Academy of Pediatrics. Red Book. 2003 Report of the Committee on Infectious Diseases. 26th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2003.
2) Guide to Clinical Preventive Services, Report of the U.S. Preventive Task Force, 2nd Edition. International Medical Publishing Inc. (same text was also published by the CDC/DHHS)
3) Centers for Disease Control and Prevention. Preventing pneumococcal disease among infants and young children: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR*. 2000;49(No. RR-9):1-35.
4) Centers for Disease Control and Prevention. Prevention and control of influenza: recommendation of the Advisory Committee on Immunization Practices (ACIP). *MMWR*. 2004;53 (No. RR-6):1-40.
5) Smith SA, Poland GA for the American Diabetes Association. Immunization and the prevention of influenza and pneumococcal disease in people with diabetes. *Diabetes Care*. 2001;24:S99-S101.
6) Advisory Committee on Immunization Practices (ACIP). Prevention of pneumococcal disease: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*.1997;46(RR-8):1-24.
7) Advisory Committee on Immunization Practices. Use of standing orders programs to increase adult vaccination rates. *MMWR Recomm Rep*. 2000;49(RR-1):15-26.
8) Clinician's Handbook of Preventive Services, Put Prevention into Practice, 1994.
9) Kronenberger CB, Hoffman RE, Lezotte DC, Marine WM. Invasive penicillin-resistant pneumococcal infections: a prevalence and historical cohort study. *Emerg Infect Dis*. 1996;2:121-124.
10) Austriam R, Gold J. Pneumococcal bacteremia with especial reference to bacteremic pneumococcal pneumonia. *Ann Intern Med*. 1964;60:759-776.
11) Mufson MA. Pneumococcal infections. *JAMA*. 1981;246:1942-1948.
12) Centers for Disease Control and Prevention. Pneumococcal vaccination for cochlear implant candidates and recipients: updated recommendations of the Advisory Committee on Immunization Practices. *MMWR*. 2003;52:739-740.